#14

1 of 3

[10191/1146]

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:		Examiner: Kaj K. Olsen
	Harald Neumann	
For:	ARRANGEMENT FOR WIRING AN ELECTROCHEMICAL SENSOR	
Filed:	August 6, 1999	Art Unit: 1744
Serial No.:	09/369,767	

Assistant Commissioner
for Patents
Washington, D.C. 20231

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on

Date 8/6/2001 Atty's Reg. # 33,865

Atty's Signature AARON C. DEDITCH

APPEAL BRIEF PURSUANT TO 37 C.F.R. § 1.192(a)

SIR:

In the above-identified patent application ("the present application"), Appellant mailed a Notice Of Appeal on May 2, 2001 (which was received by the Patent Office on May 4, 2001) from the Final Office Action issued by the U.S. Patent and Trademark Office on January 3, 2001. In the Final Office Action, claims 1 to 13 were finally rejected. An Advisory Action was mailed on March 27, 2001.

In accordance with 37 C.F.R. § 1.192(a), this Appeal Brief is being submitted in triplicate in support of the appeal of the final rejections of claims 1 to 13. For the reasons set forth below, it is respectfully submitted that the final rejections of claims 1 to 13 should be reversed.

With respect to paragraph two (2) of the Final Office Action, claims 2 to 4, 9 and 12 were rejected as indefinite under the second paragraph of 35 U.S.C. § 112. In a phone conference on August 3, 2001 between Examiner Olsen and Aaron C. Deditch (reg. no. 33,865), Examiner Olsen confirmed that upon entry of the Amendment After Final following

the filing of the Appeal Brief, the indefiniteness rejections would be withdrawn, although this was not made explicit in the Advisory Action. Accordingly, claims 2 to 4, 9 and 12 as presented are definite (as are the remaining claims).

1. REAL PARTY IN INTEREST

The real party in interest in the present appeal is Robert Bosch GmbH ("Robert Bosch") of Stuttgart in the Federal Republic of Germany. Robert Bosch is the assignee of the entire right, title and interest in the present application.

2. RELATED APPEALS AND INTERFERENCES

There are no interferences or other appeals related to the present application, which "will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal".

3. STATUS OF CLAIMS

Claims 1 and 5 to 13 stand finally rejected under 35 U.S.C. § 103(a) as unpatentable over Kato et al., U.S. Patent No. 4,909,922.

Claims 2 to 4 stand finally rejected under 35 U.S.C. § 103(a) as unpatentable over the Kato reference in view of Logethetis et al., "High Temperature Oxygen Sensors Based On Electrochemical Pumping" (ACS Symposium Series).

Claims 1, 7, 8, 10, 12, and 13 stand finally rejected under 35 U.S.C. § 103(a) as unpatentable over Stahl et al., U.S. Patent No. 4,400,260.

Claims 1 to 10, 12 and 13 stand finally rejected under 35 U.S.C. § 103(a) as unpatentable over Murase et al., U.S. Patent No. 5,413,683.

Claim 11 stands finally rejected under 35 U.S.C. § 103(a) as unpatentable over the Murase reference in view of the Kato reference.

A copy of the appealed claims is attached hereto in the Appendix.

4. STATUS OF AMENDMENTS

In response to the Final Office Action issued on January 3, 2001, Appellant filed an Amendment After A Final Office Action ("the Amendment After Final"), which was mailed on March 2, 2001 (and filed on March 5, 2001).

5. SUMMARY OF THE INVENTION

As understood, electrochemical solid electrolyte sensors for determining oxygen content in an exhaust gas of an internal combustion engine operate according to the so-called Nernst principle. In this regard, an electromotive force (EMF) is "picked off" as the probe voltage between a reference electrode having an excess of oxygen and a measurement electrode to which the measured gas is applied. The EMF occurs if an oxygen concentration λ is less than in the measured gas, where stoichiometric conditions are present in the measured gas when λ is equal to 1. The probe voltage is provided to a control device as a measurement signal. (See Specification, page 1, lines 2 to 9).

Since electrochemical solid electrolyte sensors may require a temperature of at least 300°C to operate, an electrical resistance heater (which is operated using a heating voltage corresponding to the vehicle's battery voltage) may be integrated into the solid electrolyte sensor to provide the minimum temperature. The reference electrode of the solid electrolyte sensor is connected as a positive electrode and the measurement electrode is connected to a ground (negative pole). When such a solid electrolyte sensor is operated, coupling of the heat voltage into the probe voltage may occur so as to falsify the measurement signal. As understood, in some systems, the sensing element and the heater may be separated from one another, or an electrode may be provided between the heater and the adjacent electrode to dissipate the coupled-in voltage (see Stahl (corresponding to German Patent Application No. 31 20 159, which is referenced in the "Background Information" section of the present application)). (See id. at page 2, lines 9 to 20).

To address the foregoing problem, in an exemplary embodiment according to the present invention, coupling of the heater voltage may be effectively blocked by grounding the reference electrode. Moreover, coupling may be better prevented if the reference electrode adjacent to the resistance heater lies in a layer plane of the solid electrolyte element, and has a surface extending at least approximately to that of a surface area of the measurement electrode. (See id. at page 1, lines 23 to 28).

As shown in Figure 1, an exemplary electrochemical oxygen sensor includes a ceramic element 11 made of a ceramic that conducts oxygen ions (such as, for example, stabilized ZrO_2), a measurement electrode 12 and a reference electrode 13. The measurement electrode 12 is exposed to a measured gas. The reference electrode 13 is arranged in a reference duct 15 that communicates with a reference gas, such as, for example, air. An electrical resistance heating element 17 is embedded in an electrical

insulator 18 and is integrated into the ceramic element 11. (See id. at page 2, lines 13 to 19).

In Figure 2, a resistance heater 17 is operated with a heating voltage U_H, which may be, for example, 12 V. The reference electrode 13 is operated as the positive electrode and is connected to ground, and the measurement electrode 12 is wired as the negative electrode. According to exemplary embodiment of the invention, the electrode located closest to resistance heater 17 (namely, reference electrode 13) is connected to ground for creating a negative probe voltage U_S. The result is that a negative operating voltage U_B (which powers a circuit arrangement for analyzing the negative probe voltage U_S) is made available via a circuit for generating a negative operating voltage U_B. (See id. at page 2, line 13 to page 3, line 5).

In another exemplary embodiment of an oxygen sensor, as shown in Figure 3, a reference electrode 20 extends over the width of the reference duct 15 and approximately possesses in the layer plane the surface extent of the measurement electrode 12. The larger-area reference electrode 20 provides further shield against any coupling of the heater voltage U_H into the measurement electrode 12. (See id. at page 3, lines 7 to 11).

In summary, an exemplary embodiment of the present invention is directed to an electrochemical sensor including: a solid electrolyte element including at least one first electrode, at least one second electrode and at least one heating element, the at least one second electrode being situated closer than the at least one first electrode to the at least one heating element, the at least one second electrode being coupled to ground, the at least one first electrode coacting with the at least one second electrode and being negatively polarized. (See claim 1).

In summary, an exemplary embodiment of the present invention is also directed to the above sensor in which the at least one second electrode lies in a layer plane of the solid electrolyte element, the at least one second electrode having approximately the same surface size as the at least one first electrode. (See claim 5).

In summary, an exemplary embodiment of the present invention is also directed to an electrochemical sensor including: a solid electrolyte element including at least one first electrode, at least one second electrode and at least one heating element, the at least one second electrode being situated closer than the at least one first electrode to the at least one heating element, the at least one second electrode being coupled to ground, the at least one first electrode coacting with the at least one second electrode and being negatively polarized such that coupling of heater voltage is effectively blocked. (See claim 13).

6. ISSUES

1. Under 35 U.S.C. § 103(a), are claims 1 and 5 to 13 patentable over the Kato reference.

2. Under 35 U.S.C. § 103(a), are claims 2 to 4 patentable over the Kato reference in view of the Logothetis reference?

3. Under 35 U.S.C. § 103(a), are claims 1, 7, 8, 10, 12, and 13 patentable over the Stahl reference?

4. Under 35 U.S.C. § 103(a), are claims 1 to 10, 12 and 13 patentable over the Murase reference?

5. Under 35 U.S.C. § 103(a), is claim 11 patentable over Murase in view of the Kato reference?

7. GROUPING OF CLAIMS

Group 1: Claims 1 to 4 and 6 to 13 stand or fall together.

Group 2: Claim 5 stands alone.

8. ARGUMENT

Claims 1 to 13 are now pending, all of which have been finally rejected.

Claims 1 and 5 to 13 stand finally rejected under 35 U.S.C. § 103(a) as unpatentable over Kato et al., U.S. Patent No. 4,909,922.

As regards claim 1, it is directed to an electrochemical sensor including a solid electrolyte element including at least one first electrode, at least one second electrode and at least one heating element, in which the at least one second electrode is situated closer than the at least one first electrode to the at least one heating element, in which the "*at least one second electrode is coupled to ground*", and in which the "*at least one first electrode*" coacts with the at least one second electrode and is "*negatively polarized*". As referred to above in the "Summary Of The Invention" section, the subject matter of the claims is directed to providing the benefit of effectively blocking any coupling of the heater voltage by grounding the reference electrode. It is also noted that if one electrode of the claim is negatively polarized, it follows that the other electrode in the context of the claim is positive, even though this is not expressly recited (as suggested in the Office Actions to date).

As regards the Kato reference, it purportedly concerns a heater-built-in oxygen sensor having an electrochemical cell, a reservoir formed in substantial communication with a

reference electrode of the cell, an electrically insulating member held in communication with the reservoir, a heating element disposed in contact with the insulating member and cooperating with the cell and an insulating member to constitute a "major portion" of an oxygen sensing element, and a direct current power source located outside the sensing element and electrically connected to the heating element. As stated, the low-potential portion of the sensing element connected to the negative terminal of the power source is electrically connected to a measuring electrode of the cell so that a *leakage current* of at least 0.1 microampere flows from the high-potential portion of the heating element connected to the positive terminal of the power source to the insulating member through the insulating layer at an elevated operating temperature of the sensing element. As further characterized, in this way, oxygen is pumped from the external measurement gas (to which the measuring electrode is exposed) into the reservoir as a reference gas (to which the reference electrode is exposed). (See Kato, Abstract).

As regards Figure 7 of the Kato reference, the Final Office Action conclusorily asserts the following:

> Although the lower potential element is not specified as being ground, it would have been obvious . . . to utilize ground for the negative terminal of the heater because the ground potential is a convenient lower potential. Because the second electrode is grounded (as would have been obvious to do), . . . [the] first electrode would *inherently* be negatively polarized.

(Final Office Action, page 3, paragraph 4; emphasis added).

As regards the use of the anticipation doctrine of "inherency" in an obviousness rejection, the Board of Patent Appeals & Interferences in *Ex parte Schricker* , in vacating and remanding such obviousness rejections, stated that:

> [O]n the one hand the examiner talks in terms of inherency (which is really an anticipation rationale) while on the other hand the examiner talks in terms that it would have been obvious to experiment to divine optimum conditions.
>
> *Inherency and obviousness are somewhat like oil and water -- they do not mix well.* Claimed subject matter can be anticipated because a prior art reference describes a method which inherently meets the limitations of a claimed method. Claimed subject matter can be unpatentable for obviousness when, notwithstanding a difference between that subject matter and a prior art reference, the claimed subject matter, as a whole, would have been obvious. *However, when an*

> *examiner relies on inherency, it is incumbent on the examiner to point to the "page and line" of the prior art which justifies an inherency theory.*

(See *Ex parte Schricker*, 56 U.S.P.Q.2d 1723, 1725 (Bd. Pat. App. & Int. 2000) (rejections vacated and remanded) (citations omitted; unpublished)).

More importantly, the Final Office Action and the Advisory Action have in no way established that the assertion regarding negative polarization necessarily results from the arrangement of Figure 7 -- especially where the Kato arrangement is structured for providing a leakage current as indicated above. In this regard, the Federal Circuit has stated that:

> [The] Commissioner's assertion "that the [analysis discussed in his brief] and Awamoto demonstrate that the relationship was, in fact, well known in the art" is unavailing. While the court appreciates the Commissioner's thorough explanation of the claimed relationship in his brief, the Commissioner's brief is not prior art. The prior art is Awamoto, and it does not indicate that the relationship is well known in the art nor does it suggest the claimed relationship . . . (when the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference).
>
> To support the Board's affirmance of the rejection, the Commissioner points out that in the recording art, the exact matching of signal time to recording time is an optimal condition, and that this condition would be met by fulfilling the claimed relationship. While the condition described may be an optimal one, it is not "inherent" in Awamoto. Nor are the means to achieve this optimal condition disclosed by Awamoto, explicitly or implicitly. *[The] mere fact that a certain thing may result from a given set of circumstances is not sufficient [to establish inherency and that] which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown. . . . Such a retrospective view of inherency is not a substitute for some teaching or suggestion supporting an obviousness rejection.*

(See *In re Rijckaert*, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993); citations omitted; emphasis added) (Board reversed). That is the case here, since it is respectfully submitted that the Office Actions to date have wrongly relied on inherency to substitute for what the prior art in fact describes or does not describe to a person having ordinary skill in the art -- without the benefit of hindsight based on the present invention as claimed.

Also, if the arrangement of Figure 7 of Kato were modified by grounding the one

terminal as suggested in the Final Office Action, it is believed that this may operate to render that device inoperable in view of the "leakage current" wiring arrangement of that reference. In this regard, the Federal Circuit has also made plain that if a prior art reference would lead a person skilled in the art to modify the prior art device so that it may render it inoperable, then such a modification is not obvious. (See *In re Kramer*, 18 U.S.P.Q.2d 1415, 1416 (Fed. Cir. 1991) (Board reversed)).

Still further, the Final Office Action apparently suggests that grounding the positive pole to ground is "obvious" -- which ignores the combination of the arrangement for providing the shielding benefits that are discussed in the specification and herein. Moreover, the Federal Circuit in the case of In re Kotzab has made plain that even if a claim concerns a "technologically simple concept" -- which is not believed to be the case here, there still must be some finding as to the "specific understanding or principle within the knowledge of a skilled artisan" that would motivate a person having no knowledge of the claimed subject matter to "make the combination in the manner claimed" to provide the advantages and/or benefits of the claimed subject matter, stating that:

> In this case, the Examiner and the Board fell into the hindsight trap. The idea of a single sensor controlling multiple valves, as opposed to multiple sensors controlling multiple valves, is a technologically simple concept. *With this simple concept in mind, the Patent and Trademark Office found prior art statements that in the abstract appeared to suggest the claimed limitation. But, there was no finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of Kotzab's invention to make the combination in the manner claimed.* In light of our holding of the absence of a motivation to combine the teachings in Evans, we conclude that the Board did not make out a proper *prima facie* case of obviousness in rejecting [the] claims . . . under 35 U.S.C. Section 103(a) over Evans.

(See In re Kotzab, 55 U.S.P.Q.2d 1313, 1318 (Federal Circuit 2000) (italics added)). Here again, there have been no such findings.

Moreover, to reject a claim as obvious under 35 U.S.C. § 103, the prior art must disclose or suggest each claim element and it must also suggest combining the elements in the manner contemplated by the claim. (See *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 934 (Fed. Cir. 1990), *cert. denied*, 111 S. Ct. 296 (1990); *In re Bond*, 910 F.2d 831, 834 (Fed. Cir. 1990)). Thus, the "problem confronted by the inventor must be

considered in determining whether it would have been obvious to combine the references in order to solve the problem." (See *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 679 (Fed. Cir. 1998)). In this regard, the Federal Circuit has made plain that:

> [It] is well established that in deciding that a novel combination would have been obvious, there must be supporting teaching in the prior art. "That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown."
>
> There is no suggestion or motivation in the prior art to combine these elements as combined by Newell, in order to obtain enhanced tape velocity and acceleration. The motivation to make a specific structure "is not abstract, but practical, and is always related to the properties or uses one skilled in the art would expect the [structure] to have, if made."
>
> [We have] discussed the need, in comparing the differences between the structure and properties taught in the prior art, and those of the applicant's invention, to include consideration of the problem solved by the inventor. "The determination of whether a novel structure is or is not 'obvious' requires cognizance of the properties of that structure and the problem which it solves, viewed in light of the teachings of the prior art." "*Where the invention for which a patent is sought solves a problem which persisted in the art, we must look to the problem as well as to its solution if we are to properly appraise what was done and to evaluate it against what would be obvious to one having the ordinary skills of the art.*"

(See *In re Newell*, 13 U.S.P.Q.2d 1248, 1250 (Fed. Cir. 1989) (Board reversed; citations omitted; emphasis added)).

It is respectfully submitted that the references relied on, whether taken alone or otherwise, do not suggest in any way modifying the reference so as to address the problems that are met by the presently claimed subject matter for the reasons discussed above, so that claim 1 is allowable.

Since claims 2 to 12 depend from claim 1, they are allowable for the same reasons as claim 1.

Claim 13 recites features analogous to those of claim 1, and is therefore allowable for essentially the same reasons as claim 1, as discussed above.

As further regards claim 5, it is allowable for the further reason that any review of the Kato reference makes plain that it does not in any way describe or even suggest providing

that the "at least one second electrode lies in a layer plane of the solid electrolyte element" so that it has "approximately the *same surface size* as the at least one first electrode", so as to provide further shielding benefits as explained in the specification and herein. The "masking" reasoning asserted in the Final Office Action is not supported in any way, nor does it properly frame the obviousness analysis in the context of the "coupling" problem that is addressed by the "shielding" benefits provided by the presently claimed subject matter. It is therefore respectfully submitted that claim 5 is allowable for this further reason alone.

Claims 2 to 4 stand finally rejected under 35 U.S.C. § 103(a) as unpatentable over the Kato reference in view of the article by Logethetis et al., which is entitled "High Temperature Oxygen Sensors Based On Electrochemical Oxygen Pumping" (ACS Symposium Series).

It is respectfully submitted that any review of the secondary Logothetis reference makes plain that it simply does not cure the critical deficiencies of the Kato reference, and that claims 2 to 4 are therefore allowable for the same reasons as claim 1, as explained above with respect to the Kato reference.

Claims 1, 7, 8, 10, 12, and 13 stand finally rejected under 35 U.S.C. § 103(a) as unpatentable over Stahl et al., U.S. Patent No. 4,400,260.

As regards the Stahl reference (which corresponds to the German Published Patent Application discussed and differentiated in the "Background Information" section of the present application), the Final Office Action admits (as with the Kato reference) that it does not disclose the grounding feature in the context of claim 1, as discussed above with respect to the Kato reference.

It is therefore respectfully submitted that claim 1 is allowable over Stahl for essentially the same reasons that claim 1 is allowable over the Kato reference, as are its dependent claims 7, 8, 10 and 12.

Claim 13 recites features analogous to those of claim 1, and is therefore allowable for essentially the same reasons as claim 1, as discussed above.

Claims 1 to 10, 12 and 13 stand finally rejected under 35 U.S.C. § 103(a) as unpatentable over Murase et al., U.S. Patent No. 5,413,683.

The Murase reference purportedly concerns an oxygen sensing apparatus for detecting an oxygen concentration of a gas, including a first electrochemical cell having an oxygen-ion conductive solid electrolyte body and a reference and a measuring electrode, for producing an electromotive force corresponding to the oxygen concentration of the gas. As

stated, a reference-gas chamber formed around the reference electrode is provided with a reference gas by an oxygen pumping action of the first electrochemical cell, and the apparatus further includes a second electrochemical cell including a solid electrolyte body and a pair of electrodes, one of whish is disposed in a measurement-gas chamber formed around the measuring electrode, and the other of which is exposed in an external space. As further stated, the measurement-gas chamber is provided with an oxygen gas by an oxygen pumping action of the second electrochemical cell to feed oxygen from the external space into the measurement-gas chamber. (See Murase, Abstract; Figure 1 and related text).

Accordingly, as regards the Murase reference, it is respectfully submitted that any review of that reference (including Figure 1 and its related text) makes plain that it does not disclose the grounding feature in the context of claim 1 so as to provide the shielding benefits for addressing the "coupling" problem, as discussed above with respect to the Kato reference.

It is therefore respectfully submitted that claim 1 is allowable over Murase for essentially the same reasons that claim 1 is allowable over the Kato reference, as are its dependent claims 2 to 10 and 12.

Claim 13 recites features analogous to those of claim 1, and is therefore allowable for essentially the same reasons as claim 1, as discussed above.

As further regards claim 5, it is allowable for the further reason that any review of the Murase reference makes plain that it does not in any way describe or even suggest providing that the "at least one second electrode lies in a layer plane of the solid electrolyte element" so that it has "approximately the *same surface size* as the at least one first electrode", so as to provide further shielding benefits for addressing the "coupling" problem as explained in the specification and herein. The claim as it must be reasonable interpreted in view of the specification refers to the measurement electrode and to the reference electrode -- whereas the Final Office Action does not refer to the same corresponding electrodes, nor can it since the system of Murase is premised on an entirely different arrangement. Also the obviousness analysis of that reference is also not properly framed in the context of the "coupling" problem that is addressed by the "shielding" benefits provided by the presently claimed subject matter. It is therefore respectfully submitted that claim 5 is allowable for this further reason alone.

Claim 11 stands finally rejected under 35 U.S.C. § 103(a) as unpatentable over the Murase reference in view of the Kato reference.

It is respectfully submitted that any review of the secondary Kato reference makes plain that it simply does not cure the critical deficiencies of the Murase reference, and that claim 11 is therefore allowable for the same reasons as claim 1, as explained above with respect to the Murase reference.

As further regards the obviousness rejections, the cases of In re Fine, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988), and In re Jones, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992), also make plain that the Final Office Action's assertions that the claims would have been obvious based on the reference relied upon does not properly support a § 103 rejection. It is respectfully suggested that those cases make plain that the Final Office Action reflects a subjective "obvious to try" standard, and therefore does not reflect the proper evidence to support an obviousness rejection based on the references relied upon. In particular, the Court in the case of In re Fine stated that:

> Instead, the Examiner relies on hindsight in reaching his obviousness determination. . . . **One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.**

In re Fine, 5 U.S.P.Q.2d at 1600 (citations omitted; emphasis added). Likewise, the Court in the case of In re Jones stated that:

> Conspicuously missing from this record is any evidence, other than the PTO's speculation (if it be called evidence) that one of ordinary skill . . . would have been motivated to make the modifications . . . necessary to arrive at the claimed [invention].

In re Jones, 21 U.S.P.Q.2d at 1943 & 1944 (citations omitted; italics in original).

That is the case here, since it is respectfully submitted that the Final Office Action offers no evidence whatsoever, but only conclusory hindsight, reconstruction and speculation, which these cases have indicated does not constitute evidence that will support a proper obviousness finding. In short, it is respectfully submitted that there is no evidence whatsoever -- except subjective speculation -- that the references relied upon makes obvious all of the features discussed above of the rejected claims as discussed above. It is therefore respectfully submitted that all rejected claims 1 to 13 are allowable for these further reasons.

Still further, it is respectfully submitted that not even a *prima facie* case has been

made in the present case for the obviousness rejections, since the Office Actions to date never made any findings, such as, for example, regarding in any way whatsoever what a person having ordinary skill in the art would have been at the time the claimed subject matter of the present application was made. (See *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998) (the "factual predicates underlying" a *prima facie* "obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art")). It is respectfully submitted that the proper test for showing obviousness is what the "combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art", and that the Patent Office must provide particular findings in this regard -- the evidence for which does not include "broad conclusory statements standing alone". (See *In re Kotzab*, 55 U.S.P.Q. 2d 1313, 1317 (Fed. Cir. 2000) (citing *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1618 (Fed. Cir. 1999) (obviousness rejections reversed where no findings were made "concerning the identification of the relevant art", the "level of ordinary skill in the art" or "the nature of the problem to be solved")). It is respectfully submitted that there has been no such showings by the Office Actions to date or by the Advisory Action.

In fact, it is respectfully submitted that the present lack of any of the required factual findings forces both Appellant and this Board to resort to unwarranted speculation to ascertain exactly what facts underly the present rejections. The law mandates that the allocation of the proof burdens requires that the Patent Office provide the factual basis for rejecting a patent application under 35 U.S.C. § 103. (See *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984) (citing *In re Warner*, 379 F.2d 1011, 1016, 154 U.S.P.Q. 173, 177 (C.C.P.A. 1967))). In short, the Examiner bears the initial burden of presenting a proper prima facie unpatentability case -- which he has failed to do in the present case. (See *In re Oetiker*, 977 F.2d 1443, 1445, 24, U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992)).

Accordingly, it is respectfully submitted that claims 1 to 13 are allowable over the references relied upon for these reasons.

CONCLUSION

In view of the above, it is respectfully requested that the rejections of claims 1 to 13 be reversed, and that these claims be allowed as presented.

Respectfully submitted,

Dated: 8/6/2007

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APPENDIX

1. An electrochemical sensor comprising:

a solid electrolyte element including at least one first electrode, at least one second electrode and at least one heating element, the at least one second electrode being situated closer than the at least one first electrode to the at least one heating element, the at least one second electrode being coupled to ground, the at least one first electrode coacting with the at least one second electrode and being negatively polarized.

2. (Twice Amended) The sensor according to claim 1, further comprising an arrangement for providing a negative operating voltage so that coupling of a heater voltage is effectively blocked and wherein the negative operating voltage is applied to the negatively polarized electrode.

3. The sensor according to claim 2, further comprising a measurement circuit, the negative operating voltage powering the measurement circuit.

4. (Twice Amended) The sensor according to claim 2, further comprising a circuit arrangement for analyzing a negative probe voltage (U_S), and wherein the negative operating voltage (U_B) powers the circuit arrangement.

5. The sensor according to claim 1, wherein the at least one second electrode lies in a layer plane of the solid electrolyte element, the at least one second electrode having approximately the same surface size as the at least one first electrode.

6. The sensor according to claim 1, wherein the at least one second electrode is a reference electrode communicating with a reference atmosphere, and the at least one first electrode is a measurement electrode.

7. The sensor according to claim 1, wherein the solid electrolyte element is a ceramic element.

8. The sensor according to claim 1, wherein the solid electrolyte element is ZrO_2.

9. (Amended) The sensor according to claim 1, wherein the second electrode is in a reference duct and wherein the reference duct is situated between the at least one first electrode and the at least one heating element.

10. The sensor according to claim 1, wherein a heating voltage of 12 V is applied to the at least one heating element.

11. The sensor according to claim 1, wherein the at least one heating element is embedded in an electrical insulator.

12. (Amended) The sensor according to claim 1, wherein a portion of the second electrode extends over the width of a reference duct and additionally acts as a shield against any coupling of heater voltage U_H and wherein the reference duct is situated between the at least one first electrode and the at least one heating element.

13. An electrochemical sensor comprising:

a solid electrolyte element including at least one first electrode, at least one second electrode and at least one heating element, the at least one second electrode being situated closer than the at least one first electrode to the at least one heating element, the at least one second electrode being coupled to ground, the at least one first electrode coacting with the at least one second electrode and being negatively polarized such that coupling of heater voltage is effectively blocked.